

Application Serial No.: 09/344,526  
Filing Date: June 24, 1999

### Listing of Claims

This listing of claims will replace all prior versions and listings of claims in the application:

#### In the claims

#### Claims 1-15. (Canceled)

#### 16. (Previously presented) A method of making a microsphere array comprising:

- a) contacting a substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 mm<sup>2</sup>, with a solution comprising a population of different particles, wherein said particles do not comprise an optical signature; and
- b) applying energy to said substrate or said solution, or both, such that at least a subpopulation of said different particles randomly associate onto sites.

#### 17. (Original) A method according to claim 16 wherein said discrete sites comprise wells.

#### 18. (Original) A method according to claim 16 wherein said energy is in the form of agitation.

#### 19. (Previously presented) A method according to claim 16, wherein said energy is dipping said substrate into said particles.

#### 20. (Previously presented) A method according to claim 19, wherein said substrate is a fiber optic bundle.

#### Claims 21-44. (Canceled)

#### 45. (Currently amended) A method for decoding an array composition comprising:

- a) providing an array comprising:
  - i) substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 mm<sup>2</sup>, wherein said sites are wells; and
  - ii) a population of microspheres randomly distributed on said sites, wherein said population comprises at least a first and a second subpopulation each comprising a different bioactive agent; and
- b) decoding a location of said bioactive agent by correlating said bioactive agent with said location, whereby said decoding comprises contacting said array with a pool comprising at least first and second different decoder binding ligands, whereby said first and second decoder binding ligands bind to first and second bioactive agents, respectively, to thereby identify a location of said first and second bioactive agents to thereby decode said array.

#### 46. (Previously presented) The method according to claim 45, wherein said first and second decoder binding ligand comprise first and second different labels.

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Claims 47-51. (Canceled)

52. (Currently amended) A method for decoding an array composition comprising:

a) providing an array comprising:

- i) substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 mm<sup>2</sup>, wherein said sites are wells; and
- ii) a population of microspheres randomly distributed on said sites, wherein said population comprises at least a first and a second subpopulation each comprising:

- (a) a different bioactive agent; and
- (b) a different identifier binding ligand; and

b) decoding a location of said bioactive agent by correlating said bioactive agent with said location, whereby said decoding comprises contacting said array with a pool comprising at least first and second different decoder binding ligands, to thereby identify a location of said first and second bioactive agents to thereby decode said array.

53. (Currently amended) A method for decoding an array composition comprising:

a) providing an array comprising:

- i) substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 mm<sup>2</sup>, wherein said sites are wells; and
- ii) a population of microspheres randomly distributed on said sites, wherein said population comprises at least a first and a second subpopulation each comprising:

- (a) a different bioactive agent; and
- (b) a different identifier binding ligand; and

b) decoding a location of said bioactive agent by correlating said bioactive agent with said location ~~The method according to claim 52,~~ whereby said decoding comprises contacting said array with at least first and second different decoder binding ligands, whereby said first and second decoder binding ligands bind to said first and second identifier binding ligands, whereby said first and second identifier binding ligands ~~identifies~~ identify said first and second bioactive agents, respectively, to thereby identify a location of said first and second bioactive agents to thereby decode said array.

54. (Canceled)

55. (Currently amended) A method of determining the presence of a target analyte in a sample comprising:

a) contacting said sample with an array comprising:

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- i) substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 mm<sup>2</sup>, wherein said sites are wells; and
  - ii) a population of microspheres randomly distributed on said sites, wherein said population comprises at least a first and a second subpopulation each comprising a different bioactive agent;
- b) determining the presence or absence of said target analyte; and
- c) decoding a location of said bioactive agent by correlating said bioactive agent with said location whereby said decoding comprises contacting said array with a pool of at least first and second different decoder binding ligands, whereby said first and second decoder binding ligands bind to first and second bioactive agents, respectively, to thereby identify a location of said first and second bioactive agents to thereby decode said array.

56-57 (Canceled)

58. (Currently amended) A method of determining the presence of a target analyte in a sample comprising:

- a) contacting said sample with an array comprising:
  - i) substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 mm<sup>2</sup>, wherein said sites are wells; and
  - ii) a population of microspheres randomly distributed on said sites, wherein said population comprises at least a first and a second subpopulation each comprising:
    - (a) a different bioactive agent; and
    - (b) a different identifier binding ligand, wherein said identifier binding ligands

are nucleic acids;

- b) determining the presence or absence of said target analyte; and
- c) decoding a location of said bioactive agent by correlating said bioactive agent with said location, whereby said decoding comprises contacting said array with a pool comprising at least first and second different decoder binding ligands, to thereby identify a location of said first and second bioactive agents to thereby decode said array.

59. (Currently amended) A method of determining the presence of a target analyte in a sample comprising:

- a) contacting said sample with an array comprising:

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i) substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 mm<sup>2</sup>, wherein said sites are wells; and  
ii) a population of microspheres randomly distributed on said sites, wherein said population comprises at least a first and a second subpopulation each comprising:

(a) a different bioactive agent; and

(b) a different identifier binding ligand;

b) determining the presence or absence of said target analyte; and

c) decoding a location of said bioactive agent by correlating said bioactive agent with said location—The method according to claim 58, whereby said decoding comprises contacting said array with at least first and second different decoder binding ligands, whereby said first and second decoder binding ligands bind to a first and second identifier binding ligands, whereby said first and second identifier binding ligands identifies identify said first and second bioactive agents, respectively, to thereby identify a location of said first and second bioactive agents to thereby decode said array.

60. (Currently amended) The method according to claim 45, 46, 52, 55, 58, [[or]] 59, 66, 67, 68, 69, 70, 71, 72 or 73, wherein said bioactive agents are nucleic acids.

61. (Previously presented) The method according to claim 60, wherein said nucleic acids are DNA.

62. (Previously presented) The method according to claim 60, wherein said nucleic acids are single stranded nucleic acids.

63. (Previously presented) The method according to claim 60, wherein said nucleic acids are double stranded nucleic acids.

64. (Currently amended) The method according to claim 45, 46, 52, 55, 58, [[or]] 59, 66, 67, 68, 69, 70 or 72, wherein said bioactive agents are proteins.

65. (Currently amended) The method according to claim 45, 46, 52, 53, 55, ~~56, 57~~, 58, or 59, wherein said substrate is a fiber optic bundle.

66. (New) The method according to claim 52, wherein said identifier binding ligands are nucleic acids.

67. (New) The method according to claim 66, whereby said decoding comprises hybridizing a pool of nucleic acid decoder binding ligands with said different identifier binding ligands.

68. (New) The method according to claim 58, wherein said identifier binding ligands are nucleic acids.

69. (New) The method according to claim 68, whereby said decoding comprises hybridizing a pool of nucleic acid decoder binding ligands with said different identifier binding ligands.

70. (New) The method according to claim 45, wherein said decoder binding ligands are nucleic acids.

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71. (New) The method according to claim 70, wherein said bioactive agents are nucleic acids and said decoding comprises hybridizing said decoder binding ligands with said bioactive agents.
72. (New) The method according to claim 55, wherein said decoder binding ligands are nucleic acids.
73. (New) The method according to claim 72, wherein said bioactive agents are nucleic acids and said decoding comprises hybridizing said decoder binding ligands with said bioactive agents.
74. (New) The method according to claim 60, wherein said substrate is a fiber optic bundle.